

WHAT IS CLAIMED IS:

1 1. A system for providing a scalable objective metric for
2 evaluating video quality of a video image, said system comprising:
3 an objective metric controller capable of receiving a
4 plurality of objective metric figures of merit from a plurality of
5 objective metric model units, and capable of determining said
6 scalable objective metric from said plurality of objective metric
7 figures of merit, wherein at least one pair of said plurality of
8 metric model units is interdependent.

1 2. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein the number of said plurality of objective metric figures of
4 merit may vary from two to N, where N is an integer number.

1 3. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said objective metric controller is capable of determining
4 said scalable objective metric from a correlation factor derived
5 from a mathematical description of an interdependency of said at
6 least one interdependent pair of said plurality of metric model
7 units.

1 4. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said objective metric controller is capable of determining
4 said scalable objective metric from a correlation factor derived
5 using a neural network algorithm that employs both objective
6 quality scores and subjective quality scores.

1 5. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 comprising a weighting unit that assigns weight values to each of a
4 plurality of non-interdependent objective metric figures of merit
5 by using a correlation factor, $r(i)$, for each of said objective
6 metric figures of merit, where each correlation factor, $r(i)$, for
7 an objective metric figure of merit represents how well the
8 objective metric figure of merit evaluates video image
9 characteristics.

1 6. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said plurality of objective metric model units comprises at
4 least one objective metric model unit for a desirable video image
5 feature and at least one objective metric model unit for an
6 undesirable video image feature.

1 7. The system for providing a scalable objective metric for
 2 evaluating video quality of a video image as claimed in Claim 5
 3 wherein said objective metric controller calculates a value, F , for
 4 said scalable objective metric from interdependent objective
 5 metrics using a mathematical description of interdependencies of
 6 said interdependent objective metrics.

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 2 8. The system for providing a scalable objective metric for
 3 evaluating video quality of a video image as claimed in Claim 5
 4 wherein said objective metric controller is capable of calculating
 5 a plurality of sums for a plurality of non-interdependent objective
 6 metrics where each sum, $S(r(i))$, is equal to the sum of each
 7 product of weight value, $w(i)$, and figure of merit, $f(i)$, for each
 8 of said correlation factors, $r(i)$.

1 9. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 8
3 wherein said objective metric controller is capable of obtaining
4 said scalable objective metric by selecting said scalable objective
5 metric to be the maximum value of the plurality of sums, $S(r(i))$,
6 where said maximum value represents the best correlation of
7 objective metric measurements of said video image with subjective
8 measurements of said video image.

1 10. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said objective metric controller is capable of continually
4 determining a new value of said scalable objective metric from new
5 values of said plurality of objective figures of merit as said
6 plurality of objective metric model units continually receive new
7 video images.

1 11. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said objective metric controller is capable of adding at
4 least one objective metric to said plurality of objective figures
5 of merit, and wherein said objective metric controller is capable
6 of deleting at least one objective metric from said plurality of
7 objective figures of merit.

1 12. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 wherein said objective metric controller comprises:

4 a controller capable of receiving a plurality of objective
5 metric figures of merit, $f(i)$, from a plurality of objective metric
6 model units; and

7 a metric calculation algorithm contained within a memory
8 coupled to said controller, said metric calculation algorithm
9 containing instructions capable of being executed by said
10 controller to determine a value, F , for said scalable objective
11 metric from a weighted average of said plurality of objective
12 metric figures of merit, $f(i)$, wherein at least one pair of said
13 plurality of objective metric model units is interdependent.

1 13. The system for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 1
3 comprising:

4 a plurality of objective metric model units wherein at least
5 one pair of said plurality of objective metric model units is
6 interdependent;

7 an objective metric controller capable of receiving a
8 plurality of objective metric figures of merit from said plurality
9 of objective metric model units, wherein said objective metric
10 controller is capable of determining a value, F , for said scalable
11 objective metric from a plurality of non-interdependent objective
12 metric figures of merit, $f(i)$, and capable of determining a value,
13 F , for said scalable objective metric from at least two
14 interdependent objective metrics, wherein said value F represents
15 an objective metric that represents a maximum level of correlation
16 of objective metric measurements of video quality and subjective
17 measurements of video quality.

1 14. A method for providing a scalable objective metric for
2 evaluating video quality of a video image comprising the steps of:

3 receiving in an objective metric controller a plurality of
4 objective metric figures of merit from a plurality of objective
5 metric model units wherein at least one pair of said plurality of
6 objective metric model units is interdependent; and

7 determining said scalable objective metric from said plurality
8 of said objective metric figures of merit.

9 15. The method for providing a scalable objective metric for
evaluating video quality of a video image as claimed in Claim 14
wherein the step of determining said scalable objective metric from
said plurality of said objective metric figures of merit comprises
the step of:

6 determining said scalable objective metric from a correlation
7 factor derived from a mathematical description of an
8 interdependency of said at least one interdependent pair of said
9 plurality of said objective metric model units.

1 16. The method for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 14
3 wherein the step of determining said scalable objective metric from
4 said plurality of said objective metric figures of merit comprises
5 the step of:

6 determining said scalable objective metric from a correlation
7 factor derived using a neural network algorithm that employs both
8 objective quality sources and subjective quality sources.

9 17. The method for providing a scalable objective metric for
10 evaluating video quality of a video image as claimed in Claim 14
11 further comprising the steps of:

12 assigning weight values to each of said plurality of objective
13 metric figures of merit by using a correlation factor, $r(i)$, for
14 each of a plurality of non-interdependent objective metric figures
15 of merit, where each correlation factor, $r(i)$, for an objective
16 metric figure of merit represents how well the objective metric
17 figure of merit evaluates video image characteristics.

1 18. The method for providing a scalable objective metric for
 2 evaluating video quality of a video image as claimed in Claim 14
 3 wherein said plurality of objective metric model units comprises at
 4 least one objective metric model unit for a desirable video image
 5 feature and at least one objective metric model unit for an
 6 undesirable video image feature.

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1 20. The method for providing a scalable objective metric for
2 evaluating video quality of a video image as claimed in Claim 14
3 further comprising the steps of:

4 determining a weight value, $w(i)$, for each of said plurality
5 of objective metric figures of merit;

6 keeping said weight values constant; and

7 calculating said scalable objective metric using said constant
8 weight values.

9 21. A method for providing a scalable objective metric for
10 evaluating video quality of a video image comprising the steps of:

1 receiving in an objective metric controller a plurality of
2 objective metric figures of merit from a plurality of objective
3 metric model units wherein each of said plurality of objective
4 metric model units is independent; and

5 determining said scalable objective metric from said plurality
6 of said objective metric figures of merit from a correlation factor
7 derived using a neural network algorithm that employs both
8 objective quality sources and subjective quality sources.